# Orthostatic Blood Pressure: Using a CPR to More Effectively Manage Patient Care

Robin A. Stoupa, M.S.N., & James R. Campbell, M.D., Department of Internal Medicine, University of Nebraska Medical Center, Omaha, Nebraska

We experienced dissension within our clinician group as to the proper timing for the measurement of orthostatic blood pressure. This is a time-consuming nursing procedure that has nonetheless been shown to have prognostic clinical importance. We looked for research based ambulatory guidelines for frequency of measuring orthostatic blood pressures, but found no usable standards. Thus, we set out to examine predictive factors of orthostasis and create a guideline that could be automated with our COSTAR® expert system.

All patients who arrived for care during a 3 month data collection period were eligible for inclusion. We used the expert system linked to our COSTAR nursing intake module to trigger a study alert for nursing. During 1,100 encounters to our general medicine clinic, the nursing staff measured orthostatic blood pressure along with other routine vital signs and queried patients regarding symptomatic information specific to the study. Using MQL®, one of our team reviewed the electronic record on-line to validate and store medical and nursing problems and medication profile information.

Using this data set, logistic regression suggested three models for prospective identification of patients with orthostatic blood pressure. These models were characterized by receiver operating curve (ROC) areas of .77 or greater on the initial data set. The variables included: sitting systolic blood pressure, problem of coronary artery disease, ideal body weight, and number of blood pressure medications in use by the patient.

In a separate validation step, we tested these rules during 330 subsequent encounters to a general medicine clinic. One model repeatedly showed predictive power. This model employed only one variable - sitting systolic blood pressure - and had an ROC area 0.722.

We implemented this model in an automated decision rule that now guides our nurses to obtain orthostatic pressures in selected patients with a high probability of this event.

This study demonstrates that clinical information systems can be used to more easily conduct studies that guide and shape the process of patient care. We also demonstrated that expert systems are as important in gathering high quality data, as they are in implementing guidelines.

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